



506862

Mike Kogalkowski

Task I. Recovery of Core of the Prairie du Chien-Jordan Formations
and Installation of a Relief Well Adjacent to Well W23

At a location to be designated by the State, approximately feet of W23, the Contractor shall obtain a rock core (2 1/2"-3 3/8" diameter) of the Prairie du Chien-Jordan sequence and complete the bore hole as a Prairie du Chien well, to serve as a relief well during investigative and clean-up activities on well W23. The core recovery and well construction shall be conducted as follows:

- 1) A 12-inch steel casing shall be installed and grouted through the Quaternary deposits (estimated thickness of 70 feet) and seated into the top of the Platteville Limestone.
- 2) A 6-inch steel casing shall be installed and grouted through the Quaternary deposits, Platteville Limestone, Glenwood Shale, and St. Peter Sandstone to the top of the Prairie du Chien Dolomite (estimated depth of 260 feet).
- 3) A complete core (2 1/2"-3 3/8" diameter; HQ-NQ) of the entire Prairie du Chien-Jordan sequence shall be recovered (approximate depths of 260 feet to 460 feet). The coring requirements are as follows:
 - a) A double-tube core barrel with a diamond bit and reaming shell or wire-line shall be used for rock core recovery.
 - b) The core driller shall control the speed of the coring, fluid pressures, and core length to maximize core recovery.
 - c) Grinding of core samples and blockage of core barrels must be avoided. If blockage occurs, the core barrel shall be removed and the core recovered.
 - d) Care shall be taken to recover intact cores from soft, fractured or cavernous rock. This will require the core barrel to be opened horizontally and the core carefully removed to minimize disturbance.
 - e) The core driller shall note zones of water loss, rate changes in core barrel advance, estimates of fracture or cavern width, or any other changes in coring activity that will supplement the core information.
 - f) Fractures, voids, and caverns and their estimated widths shall be clearly indicated on the recovered cores.
 - g) The Contractor shall provide partitioned wood boxes that can each accommodate 10 lineal feet of core.
 - h) The Contractor, in consultation with the on-site State representatives, shall classify the cores geologically, measure recovery percentages, place the cores in boxes, and note the core orientation, depth interval and percent recovery on each box.
 - i) The cores shall be secured and protected to prevent damage during transfer.

- j) The cores of the Jordan Sandstone shall be analyzed for polynuclear aromatic hydrocarbons, phenolics, naphthalene, benzene, and total organic carbon at 10-foot intervals or other sections selected by the State (nine samples). Any visibly contaminated sections within the Prairie du Chien, as selected by the State, shall be analyzed for the same parameters (up to 10 samples).
- 4) Upon completion of coring activities, the bore hole in the Jordan Sandstone (approximately 370 feet to 460 feet) shall be sealed with neat cement to the bottom of the Prairie du Chien Dolomites.
- 5) A pump test of the relief well at a rate prescribed by the State (approximately 100-200 gpm) shall be conducted and four samples of Prairie du Chien groundwater shall be collected. These four samples shall be analyzed by the Contractor at a State-approved lab for polynuclear aromatic hydrocarbons, phenolics, naphthalene, benzene, and total organic carbon.
- 6) A permanent submersible pump, with a capacity of 150 gpm, and a discharge line shall be installed.
- 7) The well shall be constructed in compliance with the Minnesota Water Well Construction Code.
- 8) Specifications shall be prepared for permanent well abandonment.

Task II. Investigation of Former Republic Creosote Supply Well
(U.S.G.S. Well W23)

The supply well for the former Republic Creosote facility was originally drilled to a depth of 909 feet, penetrating the bedrock sequence from the Platteville Limestone to the Mt. Simon Sandstone. The geologic log and casing schedule is as follows:

<u>Geologic Unit</u>	<u>Interval (feet)</u>	<u>Casing Schedule</u>	<u>Interval (feet)</u>
Quaternary Deposits	0-60	12"	0-65
Platteville Limestone	60-95	10"	0-257
St. Peter Sandstone	95-195	8"	0-230
St. Peter Sandstone (basal)	195-258	7"	230-373
Prairie du Chien Dolomites	258-372	4" (packer)	0-400
Jordan Sandstone	372-457		
St. Lawrence Dolomite	457-507		
Franconia Sandstone	507-650		
Iron-ton-Galesville Sandstone	650-715		
Eau Claire Shale	715-840		
Mt. Simon Sandstone	840-909		

The well bore is filled with debris to a depth of 595 feet. A plug of coal-tar (at least 1 foot thick) is found at this depth. The nature of the fill below the coal-tar plug is not known. Coal-tar is present on the surface of the 7" and 8" casings.

A packer is installed within the 7" casing at the bottom of the St. Peter Sandstone (approximately 250 feet). The packer is designed to minimize down-hole flow in the well bore from holes in the casing in the upper intervals of the St. Peter Sandstone to the Prairie du Chien Dolomite. The description of this well is based upon best available information -- a television log of the well and a U.S.G.S. geophysical log of the well (1978).

The Contractor or his subcontractor shall conduct the following tasks:

- 1) The well shall be initially pumped to obtain water samples from above and below the packer and analyzed for total phenolics, polynuclear aromatic hydrocarbons, dissolved organic carbon, total organic carbon, and benzene and naphthalene compounds.
- 2) A 3" I.D. (NW) casing shall be installed, placed to the top of the coal-tar plug, and grout shall be placed down through the casing and up around the outside of the casing so that a 10-foot cement cap is formed above the coal-tar.
- 3) The grout within the 3" casing shall be removed via cable-tool methods.
- 4) All underlying fill material will be removed via cable-tool methods. The driller shall drill to a depth of 920 feet, approximately 11 feet below the original drilled depth. If the well bore hole appears to be deeper, the driller shall drill 10 feet beyond the apparent bottom.
- 5) Samples of the fill material shall be collected at 50-foot intervals (600', 650', 700', 750', 800', 850', 900') and at the hole bottom (920'). The exact number and location of the samples may be modified in consultation with the State, based upon the character of the fill material (i.e., coal-tar, sand debris, etc.).
- 6) Samples collected under Step 5 shall be stored in sealed glass jars that have been rinsed with methylene chloride and frozen. If the samples are firm, they shall be wrapped in aluminum foil and frozen.
- 7) A log of fill material recovered from the well bore shall be developed and maintained, noting the characteristics and nature of the fill material (sand, debris, coal-tar, etc.). The presence of any visible contaminants should particularly be noted.
- 8) A representative of the State shall be on site during the operations outlined in Steps 1-7.
- 9) Fill material samples shall be analyzed by the Contractor for polynuclear aromatic hydrocarbons, phenolics, naphthalene, benzene, and total organic carbon.

- 10) Modifications in the drilling procedures and techniques may be necessary because of the unknown nature of the fill material. Any modifications must be reviewed and approved by the State.
- 11) Following completion of the well investigation, MDH shall televise and gamma-log the well.
- 12) The Contractor shall then pump and resample the well for water quality samples from above and below the packer for the same parameters detailed in Step 9, plus dissolved organic carbon.
- 13) Based upon the findings of the well investigation, fill and groundwater analyses, and MDH survey, the Contractor shall develop plans and specifications for abandonment or reconstruction of the well, in consultation with the State.

If the coal-tar is hard and brittle, the Contractor shall follow the following steps:

- 14) The Contractor shall shift to a double-barrel core recovery (NQ-wireline or reaming shell) and attempt to recover an undisturbed coal-tar sample.
- 15) The coring operation shall be conducted to the point where core recovery is unsuccessful or to a depth of 920 feet.
- 16) Samples of the core material shall be collected at the same intervals outlined in Step 5 and preserved and stored for analyses as outlined in Step 6.
- 17) The coring procedures and techniques to be followed are those detailed in points a-i of Step 3 in Task 1 (page 1), dealing with the "Recovery of Core of the Prairie du Chien-Jordan Formations."
- 18) If core recovery becomes unsuccessful, the driller shall shift to cable-tool operations described in Steps 1-13, or any other method approved by the State.

Task III. Investigation and Clean-up of the Former Minnesota Sugar Beet Company Well (U.S.G.S. Well #105):

The well is located on the former Republic Creosote site, northwest of the intersection of Louisiana Avenue and Walker Street. The log of this well, drilled by Swenson Well Drilling in 1899, is as follows:

<u>Geologic Unit</u>	<u>Interval (feet)</u>	<u>Thickness (feet)</u>
Quaternary Drift	0-73	73
Platteville Limestone	73-93	20
St. Peter Sandstone	93-260	167
Prairie du Chien Dolomites	260-385	125
Jordan Sandstone	385-504	119
St. Lawrence Shale	504-554	50
Franconia Sandstone --		
Mt. Simon Sandstone	554-950	396

There is no information available on the casing schedule or hole diameters, so it may possibly be open-hole from the Platteville Limestone.

The Contractor shall conduct the following activities:

- 1) The well shall be cleaned (remove debris and fill) to the original depth, and prepared for down-hole camera survey.
- 2) MDH shall conduct the down-hole camera survey.
- 3) A packer shall be installed by the Contractor in the basal St. Peter Sandstone interval and water samples obtained from above and below the packer and analyzed for polynuclear aromatic hydrocarbons, phenolics, naphthalene, benzene, total organic carbon, and dissolved organic carbon.

The exact location of the packer may be modified, at the direction of the State, based on the findings of the television survey.

- 4) Specifications for permanent abandonment and for recompletion as a monitoring well will be developed by the Contractor.

If visible evidence indicates the presence of coal-tar or creosote, the method of investigation will be identical to that described for W23. Some of the specific measures noted again include:

- 1) The Contractor shall maintain a log of material recovered via cable-tool or coring operations, particularly noting the presence of any visible contamination.
- 2) Samples of the fill material shall be collected by the Contractor at 50-foot intervals to 950 feet whether recovered by coring or cable-tool operations. The exact locations and the number of fill samples may be modified as directed by the State.
- 3) Fill samples shall be recovered, stored, and analyzed by the Contractor using the same procedures as described for W23 (Steps 4-10, 14-18).
- 4) Upon completion of this investigation, MDH shall televise the well. Based upon the analyses of fill samples, the well investigation, and the television surveys, the Contractor shall develop plans and specifications for permanent abandonment and reconstruction as a monitoring well, in consultation with the MDH and MPCA.

Task IV. Disposal of Hazardous Waste:

Coal-tar is regarded as hazardous waste by the State and must be treated in accordance with all provisions in the Minnesota Pollution Control Agency Rules on hazardous waste (6 MCAR 4.9001-4.9010) and the Environmental Protection Agency Rules on hazardous waste. Coal-tar does exist in Well W23 from 595

to 597 feet and may likely occur, at least partly, to the original bore hole depth. Coal-tar may also be present in Well W105, as this well may have been used for waste disposal by the Republic Creosote plant.

The Contractor shall conduct the following activities:

- 1) Hazardous waste recovered in well cleaning operations shall be containerized and stored in a secure or locked facility off the site or within a secured cyclone fence (6 feet high) enclosure on the site.
- 2) Containers and tanks shall be of sturdy, leak-proof construction. Containers shall be of adequate wall thickness, of adequate weld, hinge, and seam strength and of sufficient material strength to withstand side and bottom shock, while filled, without impairment of the ability of the container or tank to fully contain the hazardous waste.
- 3) Lids, caps, hinges, or other closure devices shall be of sufficient strength and construction so that when closed, they will withstand dropping, over-turning, or other shock without impairment of the container's or tank's ability to fully contain the hazardous waste. Gasketed closures shall be fitted with gaskets of material that is sufficient to prevent leakage and that will not be deteriorated by the contents.
- 4) Corroded or damaged containers or tanks shall not be used to contain hazardous wastes.
- 5) Containers and portable tanks of hazardous waste shall be suitable for interstate transportation.
- 6) Hazardous waste shall not be stored in containers or tanks for more than one year.
- 7) The Contractor shall regularly inspect all containers and tanks to determine if any leaks have occurred and in the event a leak has occurred, take necessary action pursuant to subparagraph 1.c.
- 8) The Contractor shall stack containers with a capacity of less than 45 gallons in rows no more than 30 feet in length, five feet in width, and six feet in height, unless otherwise stated in the Hazardous Waste Facility Permit.
- 9) The Contractor shall prepare procedures for personnel to follow in the case of spills of hazardous waste and in the case of fire and other emergencies. The Contractor shall post these procedures in a conspicuous place at the facility site.*
10. The Contractor shall have safety equipment available at the facility site for use during spills, fires, and other emergencies.

*A hazardous waste facility is real or personal property that is used or is constructed to be used for the management of hazardous waste.

**Task V. Search, Inventory, and Abandonment Specifications of Wells
in the St. Louis Park Area:**

- A. Search and Inventory.** The Contractor shall conduct a search for wells in the St. Louis Park area and compile an inventory of identified and/or discovered wells, both active and inactive, as follows:

Door-to-Door Survey: This search will be conducted in the area bounded by Cedar Lake Road on the north, Excelsior Boulevard and West 44th Street on the south, Highway 18 on the west, and France Avenue on the east. The door-to-door survey will involve contacting owners or occupants of all homes and commercial/industrial facilities within the search area, asking the contacted individuals if they are aware of any wells that exist or may have existed on their property or in the area. The Contractor shall prepare a questionnaire, which must be approved by the State. If the initial contact is not made, the Contractor shall attempt to directly contact the individuals at least two more times. Comments by individuals may necessitate follow-up discussions with local well drillers (primarily E. H. Renner & Sons, Inc.; McCarthy Well Co.; Tri-State Drilling Co.) and checks of St. Louis Park and Hopkins records (building permits, water supply records) to better document the information. The Contractor shall record all responses and follow-up site visits shall be conducted on all positive responses. The questionnaires and all information shall be submitted to the State.

File Search: This search will be conducted in the remaining areas of St. Louis Park (north of Cedar Lake Road and southeast of Excelsior Boulevard) and the area of Edina north of Interlachen Boulevard and West 50th Street. This search will involve an examination of Edina, Hopkins, and St. Louis Park records (building permits, water supply records) from the date first available; State and Federal agency records (primarily U.S. Geological Survey, Minnesota Department of Natural Resources, Minnesota Geological Survey, Minnesota Department of Health, and Minnesota Historical Society); and contacting local well drillers (primarily E. H. Renner & Sons, Inc.; McCarthy Well Co.; Tri-State Drilling Co.) and City engineers to assist in locating or describing active and inactive wells.

The results of the searches will be compiled into an inventory of located active wells, located inactive wells, and suspected inactive wells. Suspected inactive wells are wells that have not been located and are reported to exist based on individuals' recollections. This inventory will contain the following information (if available):

- 1) **Location of Well**
 - actual field location based on visual observation (include polaroid photo)
 - field location based on documented evidence (blueprints, insurance maps, etc.)
 - field location based on an individual's accounts or recollections
- 2) **Well Construction**
 - depth, casing and hole diameters, pumping capacities
 - driller, date drilled, modifications and/or repairs
 - present and previous owners, well use, history of use

- 3) Well Condition
 - active or inactive well
 - integrity of near-surface casing
 - presence of debris in the well
- 4) Sources of Information on Well
 - agency files (agency, program file)
 - city records (city department, program, file)
 - driller contacts (provide Name, Address, Phone)
 - citizen contacts (provide Name, Address, Phone)

This search and inventory compilation will expand on the inventory of wells compiled by the U.S. Geological Survey in 1978, primarily dealing with wells in the area included in the door-to-door survey.

B. Plan & Estimate of Costs for Abandonment of Wells:

Using the criteria (*) to evaluate the information gathered in the well search and inventory compilation, the Contractor shall develop a comprehensive well abandonment program which includes:

- identification of wells that should be further searched and located, assessed, and properly abandoned/reconverted
- cost estimates for cleaning well to original depth
- cost estimates for proper abandonment of well, as outlined in 7 MCAR 1.218.c. of the Water Well Construction Code
- cost estimates of reconvertng the well to a single-aquifer monitoring well
- cost estimates of obtaining alternative water supplies for active wells (i.e., reconstructed well, municipal hook-up)

Output: A report will be prepared, detailing the success of the search procedures, summarizing the number of homes and commercial/ industrial facilities actually contacted, compiling the inventory of known or suspected wells, documentation gathered on these wells, copies of any testimony of individuals regarding the wells (interviewer identified, individual contacted, date interviewed), and specifications for abandonment of important wells. Copies of all questionnaires and interviews shall be submitted to the State.

*The criteria for identifying important wells are depth and diameter (multi-aquifer wells) aquifers penetrated (i.e., Mt. Simon-Hinckley, Prairie du Chien-Jordan), type of construction (i.e., grouted versus ungrouted), proximity to areas of heavy contamination, and proximity to active wells.

Task VI: Participation in Community-Relations Plan:

Public involvement is an integral element in this project. This effort will involve public informational meetings, publication of monthly newsletters (i.e., St. Louis Park papers), organization of a public advisory committee (i.e., Environmental Review Committee), and general news releases. These efforts will largely be coordinated and handled by the MPCA, the MDH, and the City of St. Louis Park. This community relations plan, attached hereto and made a part hereof, is described in detail in Appendix G of the Application for Federal Assistance entitled "Preparation for Remedial Action in St. Louis Park" (dated 6/11/81).

The Contractor will carry out the following activities:

- 1) Review "fact sheets" for News Releases and for the Public Meetings that are prepared by the State and City.
- 2) Review monthly informational newsletters prepared by the State and City.
- 3) Participate in the initial and final public meetings (approximately 8 hours each) to provide technical explanations and summaries of Tasks I-V activities.
- 4) Participate in bimonthly Advisory Committee Meetings (3 meetings, approximately 8 hours each) to provide technical explanations of Tasks I-V activities.

Task VII: Interaction with State and City:

The Consultant shall weekly notify the State and City verbally of activity progress so that the State and City may plan to be available for on-site inspection and/or make decisions. The Consultant shall meet with the State and City the first Tuesday of each month. Monthly progress reports shall be prepared and submitted to the State and City 3 days prior to each meeting. The progress reports will highlight the activities of the previous month, project work for the following month, highlight problems encountered and the solutions implemented (including impacts on the work statement or expected costs), summarize expenditures, and provide a revised schedule. Copies of the progress reports should be distributed to the following individuals:

Jim Pankanin - U.S. EPA, Region V
Richard Bartelt - U.S. EPA, Region V
Lovell Richie - MPCA
Stephen Shakman - AG, MPCA
Gary Englund - MDH
Richard Koppy - St. Louis Park

Upon completion of the entire project, a draft report will be submitted by the Consultant to the above individuals for a review period of 3 weeks. The Consultant will take the comments into consideration and submit a final technical report for adoption. This will include a description of the completed

tasks, a summary of problems encountered for the various tasks, detailed reports called for in the specific Task descriptions, and the proposed plans and specifications for cleanup, abandonment, and reconstruction of W23, W105, and wells identified in the Survey. The proposed plans and specifications will also include a comparison of the effectiveness of various alternatives (permanent abandonment, reconstruction, no action, etc.), assessment of environmental impacts of taking such action, and assessment of methods for mitigating adverse impacts.